

REMARKS

Claims 1-9, 11-20 and 23-114 are pending in this application. Claims 4, 24-34, 45-54, 59-71 and 78-93 stand withdrawn from consideration as being directed to a non-elected invention or species of invention. Claims 2, 3, 5-9, 11-14, 17, 36, 38-44, 57, 58, 99, 103 and 110 have been deemed to present allowable subject matter and would be allowed if presented in independent form. Claims 1, 15, 16, 18-20, 23, 35, 37, 55, 56, 72-77, 94-95, 97, 98, 100-102, 104-109 and 111-114 have been objected to and/or rejected.

By this Amendment claims 1, 15, 35, 55-58, 72, 98, 100, 103-106, 108 and 110-114 have been revised. Claims 1, 15, 35, 55, 72, 98, 100, 108 and 114 (and withdrawn claims 26, 45, 47, 78, 87 and 89) are independent.

The Examiner is thanked for the continued indicated allowability (subject to placement into independent form) of claims 2, 3, 5-9, 11-14, 17, 36, 38-44, 57, 58, 99, 103 and 110. Save for minor alterations of form to claims 57, 58, 103 and 110, those claims have been maintained unchanged, since, as explained below, the claims from which they respectively depend are themselves allowable over the art of record.

The Examiner also is thanked for the personal interview conducted on December 4, 2003. In preparing this Amendment, Applicants generally have proceeded in a manner consistent with the discussions between Applicants' undersigned attorney and the Examiner during that interview. For example, various independent claims have been amended as proposed during the interview: the term "sequential access storage unit" has been changed to --storage

unit--. Also, claim 114 has been revised to conform more closely to other independent claims.¹

These changes, as explained in the Interview Summary Record, were deemed to overcome the outstanding prior art rejections. Arguments have been presented which distinguish the claimed invention from the cited art for reasons which include the grounds advanced during that meeting.

Several minor other claim changes have been made to improve the readability of the claims, and not for the purpose of overcoming any statutory claim rejection. For example, various occurrences of the term "data" have been changed to --information-- for the sake of consistency.

**The Objection to
the Claims**

Claims 1, 15, 35, 55, 72, 100 and 108 were objected to as containing certain informalities. More specifically, the Office Action suggested the claims be revised to change "accessing for rewriting" to other language.

However, as explained during the aforementioned personal interview, the present claim language is believed to be accurate and complete.² It is clear from the disclosure that the present invention involves the preferential writing of a particular type of data (ink quantity information) before other types of rewritable data during printer operation. This way, if the

¹ One change discussed during the interview which has not been made involves claim 1. It was suggested the term "rewriting any other area" be changed to --rewriting any other data--, and the other independent claims revised in the same way. However, upon further reflection, it is believed that the present claim language is more accurate, and so to avoid any issues of claim construction this change has not been made. This is not believed to affect the patentability arguments that were presented and deemed to be persuasive.

² During the personal interview the undersigned pointed out that his earlier characterizations of the present invention in prior submissions were not accurate, and that the undersigned now had a better understanding of what the current invention involves. Accordingly, those earlier characterizations of this invention should be disregarded and are hereby disavowed. Any confusion is regretted.

printer shuts down abruptly, for example, because power is lost, the ink quantity information, which is an important type of information, is stored first.

Support for the aforementioned aspects of the present invention can be found, for example, in the specification at page 72, first full paragraph, which states:

In the first and the second embodiments discussed above, the data stored in the second storage areas 660 and 760 are only the data on the remaining qualities of the respective inks. One possible modification may store other data, for example, the data on the frequency of attachment and detachment of the ink cartridges 107K and 107F and the data on the time elapsing after unsealing the ink cartridges 107K and 107F, into the second storage areas 660 and 760 as rewritable data, which are transmitted from and to the printer main body 100.

Other supporting portions of the disclosure can be found at: page 17, last paragraph, through page 18, first full paragraph; page 61, lines 1 through 13; page 63, first and second full paragraphs.

One skilled in the art would, in view of these passages, understand that the embodiment depicted in Figs. 6 and 7 can include more than one type of rewritable data and that the ink quantity information data is rewritten before the other types of rewritable data, meaning that the current language of the pending claim is accurate and need not be altered.

In other words, the comments in the Office Action are based upon the undersigned's earlier explanation of the invention which was not proper, meaning such comments themselves are based upon an incorrect explanation of the invention.

Accordingly, favorable reconsideration and withdrawal of these objections is respectfully requested.

**The Rejections Under
35 U.S.C. § 103**

Claims 1, 15, 16, 18-20, 23, 35, 37, 55, 56, 72-77, 94-96, 100, 102, 104-109 and 111-113 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,610,635 to Murray et al. in view of U.S. Patent No. 4,739,352 to Gorelick et al. Applicants respectfully traverse this rejection and submit the following arguments in support thereof.

As proposed during the personal interview, various claims have been revised slightly to clarify the aspects of this invention relating to the type of information that is stored and the timing of such storage. In this regard, it should be noted that the Interview Summary form prepared at the conclusion of the interview states in pertinent part "amending claims 1, 15, 35, 55, 72, 97, 98, 100 and 114 to recite that the ink quantity information is stored first before storing other information would overcome the teachings of Murray and Gorelick."

For clarity, Applicants will now summarize each of the rejected independent claims. It will be noted that all of these claims specify that information is stored in a particular manner such that a certain type of information is stored at the portion of the storage device that is accessed for rewriting first, before any other areas are accessed for rewriting. Such information may be ink quantity information.

These claims have been revised in the manner proposed. For example, claim 1, directed to an ink cartridge, now states in pertinent part that "the ink quantity information storage area is located at a specific area that is the area located within the storage unit that is accessed for rewriting by said printer first before accessing for rewriting any other area within the storage unit".

Similar language is found in the other claims.

Claim 15 describes an ink cartridge and provides that the ink cartridge has a storage unit storing information in a readable, writable, and non-volatile manner and being accessed in synchronism with a clock signal. This storage unit has a first storage area, in which a plurality of read only information is stored, and a second storage area, which is the area located within the storage unit that stores rewritable information relating to a quantity of ink kept in the ink reservoir and is accessed for rewriting by the printer first before accessing for rewriting any other area within the storage unit.

As set out in claim 35, this invention also is directed to a method of writing plural pieces of specific information into an ink cartridge. This can be done by receiving the plural pieces of specific information (this specific information includes information relating to a quantity of ink in the ink cartridge and other information) and rewriting the ink quantity-relating information into the storage element preferentially over the other pieces of specific information at an area within the storage element that is the area located within the storage element that is accessed for rewriting first before accessing for rewriting any other area within the storage element.

Applicants' invention, as set out in claim 55, involves an ink jet printer with an ink cartridge having a storage device. This storage device has a storage unit with a first storage area, in which read only information is stored and which is only read by the printer main body, and a second storage area, in which rewritable information is stored and which is the area located within the storage device that is accessed for rewriting by the printer first before accessing for rewriting any other area within the storage device.

With regard to claim 72, this invention also concerns a storage device mounted on an ink cartridge. The storage device has an address counter that outputs a count in response to a clock signal output from the printer and a storage element that is accessed based on the count output from the address counter and has a storage area in which plural pieces of specific information are stored in a readable, writable, rewritable and non-volatile manner. That information is stored at an area storing the specific information and located within the storage element that is accessed for rewriting by the printer first before accessing for rewriting any other area within the storage element. The specific information relates to a quantity of ink kept in the ink cartridge.

Claim 98 describes an ink cartridge having an ink reservoir for keeping ink and a non-volatile memory accessed from an access start position in synchronism with a clock signal. The memory has a first memory area for storing information not to be updated according to use of the ink cartridge and a second memory area for storing information to be updated according to use of the ink cartridge. The second memory area has a specific area for storing ink quantity information related to consumption of the ink, the specific area being located at a front end of the second memory area which is to be written first before accessing for rewriting any other area within the second memory area.

As set out in claim 100, this invention also concerns an ink cartridge configured to be detachably attached to an ink-jet printer. This cartridge includes an ink storage reservoir and a non-volatile storage element that stores information. The storage element has a first storage area for storing read-only information, and a second storage area for storing rewritable information pertaining to ink-quantity related information. The second storage area is accessed

for rewriting by the printer first before accessing for rewriting any other area within the storage element.

According to claim 108, a method of providing information in an ink cartridge involves first, storing read-only information in a first storage area of the memory, and, second, storing rewritable information, pertaining to ink-quantity related information at a second storage area of the memory. The second storage area is accessed for rewriting by the printer first before accessing for rewriting any other area within the memory.

Applicants' invention, as set out in claim 114, concerns a method of retrieving information from an ink cartridge. The cartridge has a non-volatile memory that contains read-only information at a first address and rewritable information at a second address in the memory. The second address is closer to a beginning of the memory than the first address. The method includes the steps of providing ink quantity information in the second address before other pieces of specific information at an area within the memory that is accessed for rewriting by the printer first before accessing for rewriting any other area within the memory, and reading the ink quantity information without reading the other information.

In other words, the present invention involves the writing of certain types of information at a memory location that is accessed before writing to a memory location(s) where other types of writable information are kept.

As discussed during the personal interview, and as will now be explained, these aspects of the present invention are not suggested by the cited art.

Murray discuss a printer ink cartridge having a memory storage element. While Murray gives examples of different types of information that can be kept in the memory storage

element (col. 10, lines 1-16 and col. 13, lines 1-14), Murray does not discuss how such information is arranged, much less that it is in the manner now claimed.

To the extent the Office Action asserts (page 4) that Murray, at col. 10, lines 6-7, suggests the specific location of the information storage area, Applicants respectfully disagree. Nowhere in Murray is there any mention of how information is arranged in the memory. Fig. 5, a schematic diagram of the ink cartridge's electrical circuitry, depicts the undivided memory element 48 as a rectangle without giving any details of the internal arrangement of information in that memory element. None of the other drawings give such detail either. In other words, Murray teaches that different types of information can be stored in the memory, but does not teach they are stored in any particular arrangement, much less the arrangement claimed.

The Office Action states at page 4 that "ink remaining volume has to be updated and accessed first before a large print job is started, column 9, lines 51-65". While Murray does teach checking the amount of ink before starting a large print job, that only involves reading ink quantity information prior to printing. It does not suggest the arrangement of rewritable information in the memory, much less the arrangement that is claimed.

Applicants further wish to point out that while Murray recognizes that a longer than desirable amount of time may be needed to access information in memory (col. 6, line 61, through col. 7, line 10), Murray solves this problem in a manner different from, and not suggestive of, the present invention. Murray teaches that flip-flop elements 83 are used to store information read from or to be written to the memory storage element 48. This in no way suggests the aspect of the present invention which overcome access time issues by placing particular types of information in particular areas of the memory.

Gorelick is cited only as teaching a random access memory of an imaging system can be accessed sequentially. Even if that is so, Gorelick still does not remedy the above-noted deficiencies of Murray with regard to the arrangement of rewritable information in a memory.

Claims 16, 18-20, 23, 37, 56, 73-77, 94-96, 102, 104-107, 109 and 111-113 all ultimately depend from and incorporate all the features of independent claims just shown to patentably distinguish over the cited art. These claims therefore patentably distinguish over the cited art at least for the same reasons as their respective base claims.

For all the foregoing reasons, the claimed invention therefore patentably distinguishes over the combination of Murray and Gorelick. Accordingly, favorable reconsideration and withdrawal of this rejection are favorably requested.

Claim 97 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray in view of Gorelick as applied to claim 1, and further in view of additional comments set out in the Office Action. Applicants respectfully traverse this rejection and submit the following arguments in support thereof.

Claims 97 depends from claim 1, and so incorporates by reference all the features of claim 1, including those features previously shown to avoid Murray and Gorelick. Claim 97 therefore avoids this cited art at least for the same reasons as claim 1.

For all the foregoing reasons, favorable reconsideration and withdrawal of this rejection is respectfully requested.

Claim 101 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Murray in view of Gorelick as applied to claim 100, and further in view of additional comments

presented in the Office Action. Applicants respectfully traverse this rejection and submit the following arguments in support thereof.

Claims 101 depends from claim 100, and so incorporates by reference all the features of claim 1, including those features previously shown to avoid Murray and Gorelick. Claim 101 therefore avoids this cited art at least for the same reasons as claim 100.

For all the foregoing reasons, favorable reconsideration and withdrawal of this rejection is respectfully requested.

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and in accordance with the practice under 37 C.F.R. §§ 1.97 and 1.98, the Examiner's attention is directed to the document listed on the enclosed Form PTO/SB/08a.

The Examiner is respectfully requested to confirm that these references have been considered by returning to Applicants' undersigned attorney a copy of the accompanying Information Disclosure Statement by Applicant form (PTO/SB/08a).

Since this Supplemental Information Disclosure Statement is being filed in accordance with 37 C.F.R. § 1.97(c), the Commissioner is authorized to charge the requisite fee under 37 C.F.R. § 1.17(p) (\$180), as well as any other fee which may now or hereafter be due, to Deposit Account No. 19-4709. A Fee Transmittal sheet (PTO/SB/17) is enclosed herewith.



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CONCLUSION

The Commissioner is authorized to charge any fees now or hereafter due in connection with the prosecution of this application to Deposit Account No. 19-4709.

Applicants respectfully submits that all outstanding objections and rejections have been addressed and are now either overcome or moot. Applicants further submit that all claims pending in this application are patentable over the prior art. Favorable reconsideration and withdrawal of those rejections and objections is respectfully requested.

In the event that there are any questions, or should additional information be required, please do not hesitate to contact Applicants' attorney at the number listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "David J. Schaeffer".

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